



June 7, 2002

**DESIGN MEMORANDUM No. 02-02
TECHNICAL ADVISORY**

TO: All Design, Operations, and District Personnel, and Consultants

FROM: /s/ Anthony L. Uremovich
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SUBJECT: Hot Mix Asphalt (HMA) Pavement Design Policy

EFFECTIVE: September 17, 2002, Letting

In addition to the changes outlined in Design Memorandum No. 02-02 Policy Change, the pay item names for QC/QA-HMA and HMA work have been changed as described below.

QC/QA-HMA Pay Items. The pay items for QC/QA-HMA mixtures specify the ESAL category, the high temperature performance grade, the mixture course, and the nominal size of the mixture. The size of the mixture is always specified with a metric designation to agree with the AASHTO SUPERPAVE designations.

An example of a QC/QA-HMA pay item is shown below.

QC/QA-HMA, _____, _____, _____, _____ mm
(ESAL (PG) (Course) (Mixture
Category) Size)

The ESAL categories are listed in Figure 02-02A below.

ESAL Category*	Mainline ESALs
1	< 300,000
2	300,000 < ESAL < 3,000,000
3	3,000,000 ≤ ESAL < 10,000,000
4	10,000,000 ≤ ESAL < 30,000,000
5	≥ 30,000,000

* For Open Graded Mixtures (C19.0 and C25.0), the ESAL category is 5.

ESALs FOR QC/QA-HMA MIXTURES

Figure 02-02A

The high temperature performance grade binder will vary depending on various factors included in *Indiana Design Manual* Section 52-9.02(04), and will correspond to Celsius temperatures 64, 70, or 76. The low temperature performance grade is not a design consideration. A value of -22°C is always specified. These temperatures are always specified in Celsius degrees whether the project is designed in metric or english units.

The course designation is the specific mixture and will be Surface, Intermediate, or Base.

The mixture designation will be the nominal maximum particle size of the mixture designed. Surface courses will be either 9.5 or 12.5 mm mixtures. Intermediate courses will be 12.5, 19.0, C19.0, 25.0, or C25.0 mm mixtures. Base courses will be 25.0 or 37.5 mm mixtures. The mixtures are always designated in metric units whether the project is designed in metric or english units.

EXAMPLE: The pay item QC/QA-HMA, 4, 76, Surface, 9.5 mm represents a QC/QA HMA-mixture with less than 30,000,000 ESALs, a PG 76 high temperature binder, a Surface course, and a nominal aggregate particle size of 9.5 mm.

For QC/QA-HMA mixtures, the obsoleted pay items are as follows:

Milled HMA Corrugations -- m (LFT)
 QC/QA-HMA Surface, (size) mm, Mainline -- Mg (TON)
 QC/QA-HMA Intermediate, (size) mm, Mainline -- Mg (TON)
 QC/QA-HMA Base, (size) mm, Mainline -- Mg (TON)
 QC/QA-HMA Surface, (size) mm, Shoulder -- Mg (TON)
 QC/QA-HMA Intermediate, (size) mm, Shoulder -- Mg (TON)
 QC/QA-HMA Base, (size) mm, Shoulder -- Mg (TON)

For QC/QA-HMA mixtures, the new code numbers and pay items are as follows, with all pay units Mg (TON):

401-07320 QC/QA-HMA, 1, 64, Surface, 9.5 mm
 401-07338 QC/QA-HMA, 1, 64, Surface, 12.5 mm
 401-07325 QC/QA-HMA, 1, 70, Surface, 9.5 mm
 401-07344 QC/QA-HMA, 1, 70, Surface, 12.5 mm
 401-07332 QC/QA-HMA, 1, 76, Surface, 9.5 mm
 401-07350 QC/QA-HMA, 1, 76, Surface, 12.5 mm

401-07321	QC/QA-HMA, 2, 64, Surface, 9.5 mm
401-07339	QC/QA-HMA, 2, 64, Surface, 12.5 mm
401-07327	QC/QA-HMA, 2, 70, Surface, 9.5 mm
401-07345	QC/QA-HMA, 2, 70, Surface, 12.5 mm
401-07333	QC/QA-HMA, 2, 76, Surface, 9.5 mm
401-07351	QC/QA-HMA, 2, 76, Surface, 12.5 mm
401-07322	QC/QA-HMA, 3, 64, Surface, 9.5 mm
401-07340	QC/QA-HMA, 3, 64, Surface, 12.5 mm
401-07328	QC/QA-HMA, 3, 70, Surface, 9.5 mm
401-07347	QC/QA-HMA, 3, 70, Surface, 12.5 mm
401-07334	QC/QA-HMA, 3, 76, Surface, 9.5 mm
401-07352	QC/QA-HMA, 3, 76, Surface, 12.5 mm
401-07323	QC/QA-HMA, 4, 64, Surface, 9.5 mm
401-07342	QC/QA-HMA, 4, 64, Surface, 12.5 mm
401-07329	QC/QA-HMA, 4, 70, Surface, 9.5 mm
401-07348	QC/QA-HMA, 4, 70, Surface, 12.5 mm
401-07335	QC/QA-HMA, 4, 76, Surface, 9.5 mm
401-07353	QC/QA-HMA, 4, 76, Surface, 12.5 mm
401-07324	QC/QA-HMA, 5, 64, Surface, 9.5 mm
401-07343	QC/QA-HMA, 5, 64, Surface, 12.5 mm
401-07330	QC/QA-HMA, 5, 70, Surface, 9.5 mm
401-07349	QC/QA-HMA, 5, 70, Surface, 12.5 mm
401-07337	QC/QA-HMA, 5, 76, Surface, 9.5 mm
401-07354	QC/QA-HMA, 5, 76, Surface, 12.5 mm
401-07355	QC/QA-HMA, 1, 64, Intermediate, 9.5 mm
401-07370	QC/QA-HMA, 1, 64, Intermediate, 12.5 mm
401-07389	QC/QA-HMA, 1, 64, Intermediate, 19.0 mm
401-07360	QC/QA-HMA, 1, 70, Intermediate, 9.5 mm
401-07375	QC/QA-HMA, 1, 70, Intermediate, 12.5 mm
401-07395	QC/QA-HMA, 1, 70, Intermediate, 19.0 mm
401-07365	QC/QA-HMA, 1, 76, Intermediate, 9.5 mm
401-07383	QC/QA-HMA, 1, 76, Intermediate, 12.5 mm
401-07401	QC/QA-HMA, 1, 76, Intermediate, 19.0 mm
401-07356	QC/QA-HMA, 2, 64, Intermediate, 9.5 mm
401-07371	QC/QA-HMA, 2, 64, Intermediate, 12.5 mm
401-07390	QC/QA-HMA, 2, 64, Intermediate, 19.0 mm
401-07361	QC/QA-HMA, 2, 70, Intermediate, 9.5 mm
401-07378	QC/QA-HMA, 2, 70, Intermediate, 12.5 mm
401-07397	QC/QA-HMA, 2, 70, Intermediate, 19.0 mm
401-07366	QC/QA-HMA, 2, 76, Intermediate, 9.5 mm
401-07384	QC/QA-HMA, 2, 76, Intermediate, 12.5 mm
401-07402	QC/QA-HMA, 2, 76, Intermediate, 19.0 mm

401-07357	QC/QA-HMA, 3, 64, Intermediate, 9.5 mm
401-07372	QC/QA-HMA, 3, 64, Intermediate, 12.5 mm
401-07392	QC/QA-HMA, 3, 64, Intermediate, 19.0 mm
401-07362	QC/QA-HMA, 3, 70, Intermediate, 9.5 mm
401-07379	QC/QA-HMA, 3, 70, Intermediate, 12.5 mm
401-07398	QC/QA-HMA, 3, 70, Intermediate, 19.0 mm
401-07367	QC/QA-HMA, 3, 76, Intermediate, 9.5 mm
401-07385	QC/QA-HMA, 3, 76, Intermediate, 12.5 mm
401-07403	QC/QA-HMA, 3, 76, Intermediate, 19.0 mm
401-07358	QC/QA-HMA, 4, 64, Intermediate, 9.5 mm
401-07373	QC/QA-HMA, 4, 64, Intermediate, 12.5 mm
401-07393	QC/QA-HMA, 4, 64, Intermediate, 19.0 mm
401-07363	QC/QA-HMA, 4, 70, Intermediate, 9.5 mm
401-07380	QC/QA-HMA, 4, 70, Intermediate, 12.5 mm
401-07399	QC/QA-HMA, 4, 70, Intermediate, 19.0 mm
401-07368	QC/QA-HMA, 4, 76, Intermediate, 9.5 mm
401-07387	QC/QA-HMA, 4, 76, Intermediate, 12.5 mm
401-07404	QC/QA-HMA, 4, 76, Intermediate, 19.0 mm
401-07359	QC/QA-HMA, 5, 64, Intermediate, 9.5 mm
401-07374	QC/QA-HMA, 5, 64, Intermediate, 12.5 mm
401-07394	QC/QA-HMA, 5, 64, Intermediate, 19.0 mm
401-07364	QC/QA-HMA, 5, 70, Intermediate, 9.5 mm
401-07382	QC/QA-HMA, 5, 70, Intermediate, 12.5 mm
401-07400	QC/QA-HMA, 5, 70, Intermediate, 19.0 mm
401-07369	QC/QA-HMA, 5, 76, Intermediate, 9.5 mm
401-07388	QC/QA-HMA, 5, 76, Intermediate, 12.5 mm
401-07405	QC/QA-HMA, 5, 76, Intermediate, 19.0 mm
401-07429	QC/QA-HMA, 5, 76, Intermediate, C19.0 mm
401-07430	QC/QA-HMA, 5, 76, Intermediate, C25.0 mm
401-07422	QC/QA-HMA, 1, 64, Base, 19.0 mm
401-07406	QC/QA-HMA, 1, 64, Base, 25.0 mm
401-07425	QC/QA-HMA, 1, 70, Base, 19.0 mm
401-07411	QC/QA-HMA, 1, 70, Base, 25.0 mm
401-07416	QC/QA-HMA, 1, 76, Base, 25.0 mm
401-07423	QC/QA-HMA, 2, 64, Base, 19.0 mm
401-07407	QC/QA-HMA, 2, 64, Base, 25.0 mm
401-07427	QC/QA-HMA, 2, 70, Base, 19.0 mm
401-07412	QC/QA-HMA, 2, 70, Base, 25.0 mm
401-07417	QC/QA-HMA, 2, 76, Base, 25.0 mm
401-07424	QC/QA-HMA, 3, 64, Base, 19.0 mm
401-07408	QC/QA-HMA, 3, 64, Base, 25.0 mm
401-07428	QC/QA-HMA, 3, 70, Base, 19.0 mm
401-07413	QC/QA-HMA, 3, 70, Base, 25.0 mm
401-07418	QC/QA-HMA, 3, 76, Base, 25.0 mm

401-07409	QC/QA-HMA, 4, 64, Base, 25.0 mm
401-07414	QC/QA-HMA, 4, 70, Base, 25.0 mm
401-07419	QC/QA-HMA, 4, 76, Base, 25.0 mm
401-07410	QC/QA-HMA, 5, 64, Base, 25.0 mm
401-07415	QC/QA-HMA, 5, 70, Base, 25.0 mm
401-07420	QC/QA-HMA, 5, 76, Base, 25.0 mm

HMA Pay Items. The pay items for HMA mixtures specify the type and course of material.

An example of an HMA pay item is shown below.

HMA, _____, _____
(Type) (Course)

The type is determined from ESALs calculated for the project's pavement design. If the calculated ESALs are less than 300,000, Type A mixtures should be specified. If the calculated ESALs are from 300,000 but less than 10,000,000, Type B mixtures should be specified. If the calculated ESALs are 10,000,000 or greater, Type C mixtures should be specified.

The course designation is the specific mixture and will be Surface, Intermediate, or Base.

EXAMPLE: The pay item HMA, Type B, Surface represents an HMA mixture for the ESAL range of from 300,000 to less than 10,000,000, and Surface course.

For HMA mixtures, the obsoleted pay items are as follows:

HMA Surface, (size) mm, Mainline -- Mg (TON)
HMA Intermediate, (size) mm, Mainline -- Mg (TON)
HMA Base, (size) mm, Mainline -- Mg (TON)
HMA Surface, (size) mm, Shoulder -- Mg (TON)
HMA Intermediate, (size) mm, Shoulder -- Mg (TON)
HMA Base, (size) mm, Shoulder -- Mg (TON)

For HMA mixtures, the new pay items are as follows:

402-07432	HMA, Type A, Surface -- Mg (TON)
402-07433	HMA, Type B, Surface -- Mg (TON)
402-07434	HMA, Type C, Surface -- Mg (TON)
402-07435	HMA, Type A, Intermediate -- Mg (TON)
402-07438	HMA, Type B, Intermediate -- Mg (TON)
402-07439	HMA, Type C, Intermediate -- Mg (TON)
402-07440	HMA, Type A, Base -- Mg (TON)
402-07441	HMA, Type B, Base -- Mg (TON)
402-07442	HMA, Type C, Base -- Mg (TON)
402-07450	HMA, Type A, Wedge and Level -- Mg (TON)
402-07451	HMA, Type B, Wedge and Level -- Mg (TON)
402-07452	HMA, Type C, Wedge and Level -- Mg (TON)

402-07453 HMA for Temporary Pavement – Mg (TON)

For both QC/QA-HMA and HMA mixtures, the designer should use the pay item descriptions shown for HMA mixtures in the INDOT *Standard Specifications*:

ESAL Information in Plans Title Sheet Information Block. The ESAL figures should no longer be shown in the information block.

Changes in Pay Item Names in Other Related Sections of the INDOT *Standard Specifications*. The changes in asphalt pavement requirements have affected other sections of the *Standard Specifications*. The section numbers, along with their obsoleted pay item names and pay units, and new pay item code numbers, names, and pay units, are listed below.

Section 211, obsoleted pay item as follows:

B Borrow for Structure Backfill -- m3 (CYS)

Section 211, new pay item as follows:

211-07454 Structure Backfill -- m3 (CYS)

New Section 301, new pay item as follows:

301-07448 Compacted Aggregate, No. 53, Base – Mg (TON)

New Section 302, new pay items as follows:

302-07455 Dense Graded Subbase – m3 (CYS)

302-06464 Subbase for PCCP – m3 (CYS)

Section 303, obsoleted pay items as follows

Calcium Chloride for (purpose) – Mg (TON)

Compacted Aggregate, O, Size ____ -- Mg (TON)

Compacted Aggregate, P, Size ____ – Mg (TON)

Section 303, new pay items as follows:

303-01180 Compacted Aggregate, No. 53 – Mg (TON)

303-07449 Compacted Aggregate, No. 73 – Mg (TON)

Section 304, obsoleted pay item as follows:

Subbase – m3 (CYS)

Section 304, new pay items as follows:

304-07489 HMA Patching, Type A – Mg (TON)

304-07490 HMA Patching, Type B – Mg (TON)

304-07491 HMA Patching, Type C – Mg (TON)

304-07522 Widening With QC/QA-HMA, 1, 64, Base, 19.0 mm – Mg (TON)

304-07507 Widening With QC/QA-HMA, 1, 64, Base, 25.0 mm – Mg (TON)

304-07523 Widening With QC/QA-HMA, 2, 64, Base, 19.0 mm – Mg (TON)

304-07508 Widening With QC/QA-HMA, 2, 64, Base, 25.0 mm – Mg (TON)

304-07524 Widening With QC/QA-HMA, 3, 64, Base, 19.0 mm – Mg (TON)

304-07509 Widening With QC/QA-HMA, 3, 64, Base, 25.0 mm – Mg (TON)

304-07510 Widening With QC/QA-HMA, 4, 64, Base, 25.0 mm – Mg (TON)

304-07511 Widening With QC/QA-HMA, 5, 64, Base, 25.0 mm – Mg (TON)

304-07492	Widening With HMA, Type A – Mg (TON)
304-07493	Widening With HMA, Type B – Mg (TON)
304-07494	Widening With HMA, Type C – Mg (TON)

Section 305, obsoleted pay items as follows:

Aggregate, No. 73 – Mg (TON)
 Cement Concrete -- m2 (SYS)
 Compacted Aggregate for (purpose), (type), (size) -- Mg (TON)
 Compacted Aggregate for Patching -- Mg (TON)
 Cracks and Joints in Asphalt Pavement, Seal -- Mg (TON)
 Cracks and Joints in Concrete Pavement or Base, Fill -- Mg (TON)
 HMA Patching for Asphalt Pavement -- Mg (TON)
 HMA Patching for Rigid Pavement or Base -- Mg (TON)
 HMA Patching, Temporary -- Mg (TON)
 Portland Cement Concrete for Patching (pavement type) -- m2 (SYS)
 Repairing -- km (MILE)
 Retrofit Load Transfer -- EACH
 Sawing and Sealing Transverse Joints -- m (LFT)
 Water for Reconditioning -- kL (kGAL)
 Widening with Compacted Aggregate,(type), (size) -- Mg (TON)
 Widening with HMA -- Mg (TON)
 Widening with QC/QA-HMA -- Mg (TON)

Section 305, new pay items as follows:

305-07456	PCC Base, 200 mm – m2
305-07457	PCC Base, 225 mm – m2
305-07458	PCC Base, 250 mm – m2
305-07459	PCC Base, 275 mm – m2
305-07460	PCC Base, 300 mm – m2
305-07461	PCC Base, 325 mm – m2
305-07462	PCC Base, 350 mm – m2
305-07463	PCC Base Patching, 200 mm – m2
305-07464	PCC Base Patching, 225 mm – m2
305-07465	PCC Base Patching, 250 mm – m2
305-07466	PCC Base Patching, 275 mm – m2
305-07468	PCC Base Patching, 300 mm – m2
305-07469	PCC Base Patching, 325 mm – m2
305-07470	PCC Base Patching, 350 mm – m2
305-07471	Widening with PCC Base, 200 mm – m2
305-07472	Widening with PCC Base, 225 mm – m2
305-07473	Widening with PCC Base, 250 mm – m2
305-07474	Widening with PCC Base, 275 mm – m2
305-07475	Widening with PCC Base, 300 mm – m2
305-07476	Widening with PCC Base, 325 mm – m2
305-07477	Widening with PCC Base, 350 mm – m2

305-07456 PCC Base, 8 in. – SYS
305-07457 PCC Base, 9 in. – SYS
305-07458 PCC Base, 10 in. – SYS
305-07459 PCC Base, 11 in. – SYS
305-07460 PCC Base, 12 in. – SYS
305-07461 PCC Base, 13 in. – SYS
305-07462 PCC Base, 14 in. – SYS

305-07463 PCC Base Patching, 8 in. – SYS
305-07464 PCC Base Patching, 9 in. – SYS
305-07465 PCC Base Patching, 10 in. – SYS
305-07466 PCC Base Patching, 11 in. – SYS
305-07468 PCC Base Patching, 12 in. – SYS
305-07469 PCC Base Patching, 13 in. – SYS
305-07470 PCC Base Patching, 14 in. – SYS

305-07471 Widening with PCC Base, 8 in. – SYS
305-07472 Widening with PCC Base, 9 in. – SYS
305-07473 Widening with PCC Base, 10 in. – SYS
305-07474 Widening with PCC Base, 11 in. – SYS
305-07475 Widening with PCC Base, 12 in. – SYS
305-07476 Widening with PCC Base, 13 in. – SYS
305-07477 Widening with PCC Base, 14 in. – SYS

Section 307 has been blanked. Obsolete pay items as follows:

Curb, Monolithic – m (LFT)

Portland Cement Concrete Base – m2 (SYS)

Section 408, new pay items as follows:

408-07504 Cracks and Joints in Asphalt Pavement, Seal – Mg (TON)

408-07478 Cracks and Joints in Asphalt Pavement, Rout and Seal –
Mg (TON)

Section 501, obsolete pay item as follows:

Milled PCCP Corrugations – m (LFT)

Section 507, new pay items as follows:

507-07479 HMA Partial Depth Patching – Mg (TON)

507-07480 PCCP Profiling – m2 (SYS)

507-07481 Cracks and Joints in PCCP, Seal – m (LFT)

507-07482 Cracks and Joints in PCCP, Rout and Seal – m (LFT)

507-06969 Retrofit Load Transfer – EACH

Section 604, new pay item as follows:

604-07505 HMA for Sidewalk – Mg (TON)

Section 610, obsolete pay items as follows:

Compacted Aggregate, (type) -- Mg (TON)

HMA for Approaches -- Mg (TON)

Section 610, new pay items as follows:

610-07506	Compacted Aggregate, No. 53 -- Mg (TON)
610-07486	HMA, Type A, Approaches -- Mg (TON)
610-07487	HMA, Type B, Approaches -- Mg (TON)
610-07488	HMA, Type C, Approaches -- Mg (TON)

Section 611, obsoleted pay items as follows:

Compacted Aggregate, (<u>type</u>) –m2 (SYS)
HMA for (<u>location</u>), - Mg(TON)

Pay item names and pay units which are shown in these sections of the *Standard Specifications* but are not listed above are not affected by this memorandum.

Discontinued Recurring Special Provisions. The following recurring special provisions have been discontinued due to issuance of this memorandum.

<u>Code No.</u>	<u>Title</u>
211-R-357	B Borrow and B Borrow for Structure Backfill
303-R-248	Recycling Existing Concrete Pavement as Compacted Aggregate
304-R-199	Subbase for Cement Concrete Pavement
305-R-139	Joint Patching Material
311-R-229	Concrete Pavement Cracking and Sealing
400-R-385	Contractor Acceptance Procedures for QC/QA Hot Mix Asphalt Pavement
400-R-389	QC/QA-HMA Volumetrics
400-R-390	Volumetrics Hot Mix Asphalt Producer Program
400-R-391	Contractor QCP for Volumetric Hot Mix Asphalt Pavements
400-R-392	Sampling HMA for Volumetric Contracts
400-R-393	Fine Aggregates for HMA Mixtures
401-R-324	Plant Laboratory for Plant Mix Pavements
402-R-295	Microsurfacing
500-R-383	PCCP
715-R-341	Pipe Material Selection
718-R-326	Underdrains
718-R-326a	Underdrains

New Recurring Special Provisions. The following recurring special provisions have been added due to issuance of this memorandum. They should be called for in all contracts with HMA-oriented pay items through the February 1993 letting, and should stand without modification. Beginning with the March 2003 letting, they will become standard specifications.

<u>Code No.</u>	<u>Title</u>
100-R-423	Section 100 Revisions
200-R-424	Section 200 Revisions
300-R-425	Section 300 Revisions
400-R-421	HMA 2003
500-R-422	PCCP 2003
600-R-426	Section 600 Revisions
700-R-427	Section 700 Revisions
800-R-428	Section 800 Revisions
801-R-430	Temporary Concrete Barrier and Temporary Traffic Signs
900-R-429	Section 900 Revisions

Standard Drawings. The following standard drawings have been affected due to issuance of this memorandum.

<u>Dwg. No.</u>	<u>Subject</u>
610-DRIV-04	Class II Drive
610-DRIV-05	Class II Drive
610-DRIV-09	Class IV Drive
610-DRIV-12	Class VI Drive
610-PRAP-02	Public Road Approach Type A
610-PRAP-03	Public Road Approach Type B
610-PRAP-06	Public Road Approach Type C
610-PRAP-10	Public Road Approach Type D
610-UTM0-01	U-Turn Median Opening
801-TCLG-01	Traffic Control Legend and General Notes

New Recurring Plan Detail. Recurring plan detail 610-R-428d has been added due to issuance of this memorandum. The detail consists of revisions to the series of standard drawings listed above. These recurring plan details should be called for in all contracts with HMA-oriented pay items through the February 2003 letting. Beginning with the March 2003 letting, they will become revised standard drawings with the numbers shown above.

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